

REMARKS

In the Office Action mailed March 28, 2006, the Examiner noted that claims 1-4, 6-48 and 50-52 were pending, and rejected claims 1-4, 6-48 and 50-52. Claims 1, 9, 18, 23, 31, 40, 45-48, 50 and 52 have been amended, claims 51 has been canceled, and, thus, in view of the forgoing claims 1-4, 6-48, 50 and 52 remain pending for reconsideration which is requested. No new matter has been added. The Examiner's rejections are traversed below.

Claim Amendment Entry And Consideration is Requested

The claims have been amended, in consideration of the Examiner's welcomed "suggestion" of Action page 2, so that now all claims emphasize that a match occurs when there is a match in "position, type and direction". Note, this feature does not raise new issues as it was previously before the Examiner in, for example, claims 50 and 52.

The claims have been amended so that all the claims emphasize, that a match of a target feature point ("a feature point to be checked") between two fingerprints occurs when there is a match between "vicinal feature points" in position, type and direction. That is, in addition to allowing a check of a target feature point ("a feature point to be checked") between fingerprints, the present invention also checks vicinal feature points when attempting to determine/declare a match between target feature points. Note, this feature does not raise new issues as it was previously before the Examiner in, for example, claim 1.

The claims have been amended so that all the claims emphasize when matching a vicinal point feature point direction while matching in position type and direction of the vicinal feature points, that the "feature point direction is ridge direction when the feature point is an end point and a direction of a larger number of ridges when the feature point is a bifurcation point". Note, this feature does not raise new issues as it was previously before the Examiner in, for example, claim 52.

Claims 50 and 52 have been amended to clarify that the target feature point is the feature point being checked. Note, this feature does not raise new issues as it was previously before the Examiner in, for example, claim 1.

Because no new issues are being raised, the Examiner is requested to enter and consider this amendment.

The Rejections

The Examiner has rejected the claims under section 102 over Fujii (claims 1-4, 6-48 and 50-51) or under section 103 over Fujii in combination with Jain (claims 50-52).

Fujii is directed to a system that matches target feature points to determine whether two fingerprints match even when the fingerprints are distorted relative to each other. This is accomplished by, among other things, projecting a feature point on one ridge to another ridge creating a virtual feature point on the second ridge. Fujii does not discuss using vicinal feature points in addition to the target and projected/virtual feature points, and does not even use the term "vicinal." In contrast, the present invention, see for example claim 1, determines whether "feature points to be checked" (or a target feature points) match by determining whether vicinal feature points "near a feature point to be checked" match. When the vicinal feature points match ("when said first and second fingerprints match in ... the vicinal feature points") the target feature points of the fingerprints are identified as matching ("it is determined that feature information of feature points to be checked contained in the first and the second fingerprints are the same feature points"). That is, a match between target feature points is determined by a process of matching vicinal feature points. Fujii does not teach or suggest such. Jain adds nothing to Fujii with respect to this feature. It is submitted that the present invention patentably distinguishes over the prior art for this reason.

In making the rejection, the Examiner reasserts that Fujii teaches a ridge direction. As acknowledged by the Examiner, Fujii discusses a direction based on a ridge count of ridges crossed as being positive for above and negative for below. However, this is not a ridge direction but rather as acknowledged by the Examiner a "ridge connection direction". The Applicants must insist that a ridge connection direction that is based on ridge count of ridges crossed by a connecting line and being positive for a connecting ridge that is above and negative for a connected ridge that is below is not a ridge direction. And certainly not a feature point direction defined as a "ridge direction when the feature point is an end point and a direction of a larger number of ridges when the feature point is a bifurcation point". It is submitted that Fujii does not teach or suggest such and the present invention distinguishes over Fujii for this additional reason.

The Examiner asserts that Jain teaches this definition of direction provided in the claims pointing to Jain col. 18, lines 1-21. This text of Jain particularly states:

Step 435 uses the final output of step 430 to identify the minutiae. Without loss of generality, we assume that if a pixel is on a thinned ridge (8-connected), then it has a value 1, and 0 otherwise. Let (x,y) denote a pixel on a thinned ridge, and $N_{sub.0}$ $N_{sub.1}$, . . . , $N_{sub.7}$ denote its 8 neighbors. A pixel (x,y) is a ridge ending if

##EQU12##

and a ridge bifurcation if

##EQU13##

For each detected minutiae, the following parameters are recorded: (i) x-coordinate, (ii) y-coordinate, (iii) orientation which is defined as the local ridge orientation of the associated ridge, and (iv) the associated ridge segment.
(Jain col. 18, lines 1-21)

This text, while it does say that the minutiae includes an orientation which is defined as the local ridge orientation of the associated ridge, does not describe what is meant by "local ridge orientation of the associated ridge". The text clearly does not teach the direction of the claimed invention as discussed above. In such situation where a definition is not provided, as in the Jain text above, the reader is left to supply that definition. In such a situation with respect to a bifurcation, the orientation could be a number of different things: the orientation of the ridge on the unbifurcated side, the orientation of the longest branch whether on the bifurcated side or not, the orientation of the shortest branch, the orientation of the branch most aligned with the ridge on the non-bifurcated side, etc. Jain does not even mention any of the above-discussed possibilities. The Examiner, based on hindsight, has chosen an orientation definition to "read into" the text of Jain that agrees with the claimed definition. The Examiner has argued that the use of the definition of the invention would have been obvious over Jain because an accurate and reliable minutiae are required to effectively identify a person in the comparison process. Without knowing which of the unspoken possibilities are accurate and reliable, which Jain does address, it is merely the Examiners opinion, based on hindsight or personal knowledge, that has motivated the Examiner to assert that the claimed definition is the one that is obvious. There is no teaching or suggestion and certainly no motivation provided by Jain that would motivate a reader to chose one definition over the other. It is submitted that the Examiner is impermissibly using hindsight or personal knowledge to supply motivation where no motivation is provided by the prior art, and withdrawal of the rejection on this additional basis is requested.

If the Examiner is using personal knowledge to select the definition of the claimed invention over other possibilities, the Examiner is requested to support the personal knowledge with an affidavit (The personal knowledge of the Examiner when used as a basis for a rejection "must be supported" by an affidavit as to the specifics of the facts of that knowledge when called for by applicant. See, e.g. 37 C.F.R. section 1.104(d)(2)).

As noted by the Examiner, Fujii matches in type and position. In contrast, the present invention matches or compares "position, type and direction". Jain adds nothing to Fujii with respect to this feature. It is submitted that the present invention patentable distinguishes over the prior art for this additional reason.

It is submitted that the inventions of the independent claims distinguishes over the prior art and withdrawal of the rejection is requested.

The dependent claims depend from the above-discussed independent claims and are patentable over the prior art for the reasons discussed above. The dependent claims also recite additional features not taught or suggested by the prior art. For example, claim 3 calls for an additional match criteria - a ridge count range between the target feature point and the vicinal feature point matching between fingerprints for the target feature point. This is, in claim 3, not only is position, type and direction matching needed but also a ridge count. The Examiner is requested to note that this ridge count is somewhat like the "nth degree" direction noted by the Examiner in Fujii. As a result, the "direction" in parent claim 1 must be something different from the ridge count misinterpreted by the Examiner as the ridge direction in Fujii. Claim 6 emphasizes that a matching level is produced when there is not a match in type. The prior art does not teach or suggest such. It is submitted that the dependent claims are independently patentable over the prior art.

It is submitted that the claims are not taught, disclosed or suggested by the prior art. The claims are therefore in a condition suitable for allowance. An early Notice of Allowance is requested.

If any further fees, other than and except for the issue fee, are necessary with respect to this paper, the U.S.P.T.O. is requested to obtain the same from deposit account number 19-3935.

Respectfully submitted,

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